Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An oxygen monitoring apparatus comprising;

a respiratory flow component comprising ~~a replaceable~~ an aperture for removably retaining a luminescable element ~~having~~ and a luminescable composition; and

a transducer comprising a radiation source oriented toward the luminescable element to emit at least one wavelength of first electromagnetic radiation ~~capable of~~ for exciting the luminescable composition ~~of the luminescable element of the respiratory flow component, which when excited emits~~ to emit at least one wavelength of second electromagnetic radiation; and

a detector positioned adjacent to the radiation source so as to be located on a same side of the respiratory flow component as the radiation source to sense ~~a~~ the at least one wavelength of the second electromagnetic radiation emitted by said luminescable composition and to produce a signal indicative of an intensity of said at least one wavelength emitted by said luminescable composition,

wherein the respiratory flow component is adapted to be removably securable to the transducer ~~only~~ in a single correct orientation.

2. (Previously presented) The apparatus of claim 1, further comprising a processor,

wherein said detector is configured to communicate said signal to the processor.

3. (Previously presented) The apparatus of claim 2, wherein said processor is configured to increase a signal-to-noise ratio of said signal.

4. (Previously presented) The apparatus of claim 3, wherein said processor is configured to convert said signal into an oxygen concentration signal.

5. (Previously presented) The apparatus of claim 4, wherein said processor operates under a first signal processing protocol if an oxygen concentration in monitored gases is less than or equal to a set threshold and operates under a second signal processing protocol if the oxygen concentration in said monitored gases is equal to or exceeds a set threshold.

6. (Previously presented) The apparatus of claim 1, wherein said detector comprises a photodiode.

7. (Previously presented) The apparatus of claim 6, wherein said photodiode comprises a PIN silicon photodiode.

8. (Previously presented) The apparatus of claim 1, wherein said second electromagnetic radiation having wavelengths from about 500 nm to about 1,100 nm.

9. (Previously presented) The apparatus of claim 1, wherein said second electromagnetic radiation is in the visible light range.

10. (Previously presented) The apparatus of claim 1, wherein said detector, upon sensing at least a calibration wavelength of electromagnetic radiation, generates a calibration signal.

11. (Previously presented) The apparatus of claim 1, the transducer further comprising a reference detector positioned adjacent to the radiation source so as to be located on a same side of the respiratory flow component as the radiation source.

12. (Previously presented) The apparatus of claim 11, the transducer further comprising a beam splitter provided between the detector and the luminescable element for dividing the second electromagnetic radiation between said detector and said reference detector.

13. (Previously presented) The apparatus of claim 1, wherein said radiation source comprises a light-emitting diode.

14. (Previously presented) The apparatus of claim 1, wherein said radiation source emits at least a blue or green wavelength of visible light.

15. (Previously presented) The apparatus of claim 1, wherein said radiation source emits at least one wavelength of the first electromagnetic radiation of from about 300 nm to about 600 nm.

16. (Previously presented) The apparatus of claim 1, wherein said radiation source is configured to emit said first electromagnetic radiation in a pulsed manner.

17. (Currently amended) The apparatus of claim 1, the transducer further comprising a second radiation source ~~which emits~~ for emitting at least a calibration wavelength of the first electromagnetic radiation.

18. (Previously presented) The apparatus of claim 17, wherein said calibration wavelength of the first electromagnetic radiation emitted from said second radiation source does not substantially cause said luminescable composition to luminesce.

19. (Previously presented) The apparatus of claim 17, wherein said second radiation source emits at least an orange, red, or infrared wavelength of electromagnetic radiation.

20. (Previously presented) The apparatus of claim 1, the transducer further comprising at least one optical filtering element.

21. (Previously presented) The apparatus of claim 20, wherein, when the transducer is secured on the respiratory flow component, said optical filtering element is positioned in an optical path between said luminescable composition and said detector.

22. (Previously presented) The apparatus of claim 20, wherein said optical filtering element is positioned adjacent said radiation source to prevent exposure of said luminescable composition to the at least one wavelength of the first electromagnetic radiation.

23. (Previously presented) The apparatus of claim 20, wherein said optical filtering element is positioned to prevent said detector from receiving the second electromagnetic radiation that does not indicate an amount of oxygen to which said luminescable composition has been exposed.

24. (Previously presented) The apparatus of claim 1, further comprising at least a portion of a temperature control component configured to maintain said luminescable composition at a substantially constant temperature.

25. (Currently amended) The apparatus of claim 24, wherein the luminescable element further comprises a thermal capacitor and said temperature control component includes a heater component configured to contact the thermal capacitor ~~of the luminescable~~

~~element~~.

26. (Previously presented) The apparatus of claim 25, wherein said temperature control component is exposed through the transducer.

27. (Previously presented) The apparatus of claim 25, wherein said heater component is configured to contact the thermal capacitor.

28. (Previously presented) The apparatus of claim 25, wherein said heater component includes a thermally conductive component and a thick film heater in contact therewith.

29. (Previously presented) The apparatus of claim 25, the transducer further comprising a temperature control associated with said heater component.

30. (Currently amended) The apparatus of claim 25, the transducer further comprising a temperature sensor ~~configured~~ to sense a temperature of at least one of said heater component, said thermal capacitor, and said luminescable composition.

31. (Previously presented) The apparatus of claim 1, the transducer further including a center section and first and second end sections positioned on opposite sides of said center section and cooperating to define a receptacle configured to receive a portion of the respiratory flow component.

32. (Previously presented) The apparatus of claim 31, wherein said receptacle is configured to maintain an assembled relationship of the transducer with the respiratory flow component.

33. (Previously presented) The apparatus of claim 31, wherein said receptacle is configured to prevent improper assembly of the transducer with the respiratory flow component.

34. (Previously presented) The apparatus of claim 31, wherein said radiation source is positioned at least partially in said first end section and said detector is positioned at least partially in said second end section.

35. (Previously presented) The apparatus of claim 1, wherein said signal indicative of said intensity of said second electromagnetic radiation emitted by said luminescable composition is also indicative of a concentration of oxygen in respiratory gas to which said luminescable composition is exposed.

36. (Currently amended) A transducer of an oxygen monitoring apparatus, the transducer configured to be removably secured ~~only~~ in ~~one~~ a single correct orientation to a respiratory flow component, ~~having a replaceable luminescable element and~~ the transducer comprising:

a radiation source oriented toward a luminescable element to emit ~~at least a wavelength of~~ first electromagnetic radiation ~~capable of~~ for exciting a luminescable composition ~~in communication with the respiratory flow component~~ to emit second electromagnetic radiation toward an area of an exterior surface of the luminescable element of the respiratory flow component, the respiratory flow component having an aperture for removably retaining the luminescable composition and luminescable element; and

a detector positioned adjacent to the radiation source so as to be located on a same side of a same window of the respiratory flow component as the radiation source and oriented toward substantially a same location as the radiation source, and configured to:

sense said second electromagnetic radiation of ~~at least one wavelength emitted by~~ said luminescable composition, through the window of the respiratory flow component; and

produce a signal indicative of an intensity of said ~~at least one wavelength~~ second electromagnetic radiation emitted by said luminescable composition, and being substantially stable for a period of at least about eight hours.

37. (Previously presented) The transducer of claim 36, wherein the detector has a stability of about ±2 torr over eight hours at an atmospheric oxygen concentration.

38. (Currently amended) A transducer of an oxygen monitoring apparatus, the

transducer configured to be removably secured ~~only~~ in ~~one~~ a single correct orientation to a respiratory flow component ~~having a replaceable luminescable element~~, the transducer comprising:

a radiation source oriented to emit at least one wavelength of first electromagnetic radiation ~~capable of~~ for exciting a luminescable composition ~~in communication with the respiratory flow component~~ in a modulated fashion~~,~~ to emit at least one wavelength of second electromagnetic radiation toward an area of an exterior surface of ~~the~~ a luminescable element~~,~~ ~~of~~ the respiratory flow component having an aperture for removably retaining the luminescable composition and luminescable element;

a detector positioned adjacent to the radiation source and oriented ~~toward the exterior surface of the luminescable element and oriented~~ toward a same area of the exterior surface of the luminescable element as ~~the area toward which~~ the radiation source, the detector ~~is oriented, and configured to:~~

~~sense~~ senses electromagnetic radiation of the at least one wavelength of second electromagnetic radiation emitted by said luminescable composition, through ~~the~~ a window of the respiratory flow component~~;~~, and

~~produce~~ produces a signal indicative of an intensity of said at least one wavelength emitted by said luminescable composition; and

a signal processor that receives the signal from the detector and outputs a modified signal with a phase angle corresponding to a decay time of an excited luminescent composition of the respiratory flow component.